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## Construction of statistical shape atlases for bone structures based on two-level framework

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### Abstract

**Background** The statistical shape atlas is a 3D medical image analysis tool that encodes shape variations between populations. However, efficiency, accuracy, and finding the correct correspondence, are still unsolved issues during the construction of the atlas.

**Methods** We developed a two-level based framework which speeds up the registration process while maintaining accuracy of the atlas. We also proposed a semi-automatic strategy to achieve segmentation and registration simultaneously, without knowing any prior information about the shape.

**Results** We have constructed the atlas for the femur and spine, separately. Experimental results demonstrate the efficiency and accuracy of our methods.

**Conclusions** Our two-level framework and semi-automatic strategy are able to efficiently construct the atlas for bone structures without losing accuracy. We can handle either 3D surface data or raw DICOM images.

### Notes

- **Number of pages:** 48

### Text Reference

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